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CHINA REPORT

SCIENCE AND TECHNOLOGY

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CONTENTS

PEOPLE'S REPUBLIC OF CHINA

APPLIED SCIENCES

ABSTRACTS

APPLIED SCIENCES

PRIORITY SCIENTIFIC, TECHNICAL TASKS OUTLINED

Beijing QIZHONG YUNSHU JIXIE [HOISTS AND CONVEYANCES] in Chinese No 7, 1982 pp 2-4

[Article by Xu Wei [6079 0251] of the General Bureau of Heavy Mining Machinery of the First Ministry of Machine Building: "Give Priority to Scientific and Technical Work"]

[Text] To enable the heavy mining machinery manufacturing industry to better adapt to the needs in economic readjustment and stable growth, the primary task is to readjust further the orientation of service, expand the scope of service, improve the quality of service, and improve adaptive capability.

In the course of realizing this task, we must first solve scientific and technical problems. This means we must give priority to scientific and technical work.

During these few years, scientific and technical work in the heavy mining machinery manufacturing industry has scored a number of achievements. In serving to provide daily consumer commodities, it has already directly manufactured several new types and has developed special machinery to process spare parts for various types of bicycles and sewing machines, and light industrial machinery such as beer-brewing equipment and sugar-refining equipment. It has expanded the varieties, specifications, and output of equipment for the production of such light industrial materials as aluminum plates, aluminum foil, welded pipes, and artificial board and improved their adequacy as complete sets of products. In serving the building sector, it has developed steel mold plates for pouring concrete, the production line to produce concrete beams and pillars, equipment to make bricks from furnace slag, and tower cranes for building higher stores of buildings. In serving technical improvements of various industries, it has provided many types of products for completing whole sets of equipment for work procedures in manufacturing medium and small rollers and for renovation of equipment. It has shouldered the task of improving small cement plants mainly by improving the grades of cement and by expanding output, and it has fitted construction machinery and hoisting equipment with many types of operating devices, or developed different-shaped products to adapt to the needs in different uses. In serving imports and exports, it has emphasized the improvement of the design and technology of such batch-manufactured products as chain blocks, jacks, and fork lifts, improved their quality, and reduced their cost. In conducting research in new technology, it has launched experimental research on many aspects, such

as the remelting of electroslag, the shaping of furan resin sand, the shaping of the heat insultating cap for externally cooled iron, the production of all-fiber interlocking extruded crank shafts, and gravity welding. These achievements have served importantly to readjust the direction of service and expanded the scope of service by the heavy mining machinery manufacturing industry.

But, we must also see that the scientific and technical work of some factories and research institutes is still in a relatively backward stage. There have been no outstanding breakthroughs in technology, there are no relatively long-range technical preparations, and progress in the buildup of scientific research bases is slow. All of these show that our scientific and technical work still cannot adapt to the needs of the objective situation.

Some personal views concerning problems in the present scientific and technical work of the heavy mining machinery manufacturing industry are presented in the following date to facilitate discussions with a broad range of comrades on the scientific and technical work front.

(I) We Must Clarify the Direction of Major Efforts; There Must Be Relatively Long-Range Plans

Each basic level unit must mobilize a broad range of engineers and technical personnel to forecast demand in domestic and foreign markets through investigative research, to combine efforts with the advantages and characteristics of each unit itself, to determine the major direction of one's own efforts in scientific and technical work, and to decide what new products can be produced within the near term, how old products can be improved, what product lines should be expanded to make whole sets, in which key technolgoies breakthroughs can be made, and how technical improvements in one's own unit can be made? After answering these questions, the direction can be clarified, the goals can be made concrete, plans can be drawn up and they can be implemented by the individual.

In particular, because the period of preparation for products of our heavy mining machinery manufacturing industry and the production cycle are both relatively lengthy, we must never grasp only the present in scientific and technical work and care only about what is before us. There must be a 2 to 3 year plan or a 3 to 5 year plan. Of course, we should also make readjustments or supplement deficiences according to changes in the situation at any moment during the course of carrying out such plans. Only in this way can each unit realize a definite initiative.

(II) We Must Start Out From Building Whole Sets, Familiarize Ourselves With and Master the Use of Technological Processes

Most heavy mining machinery is linked up in use according to the technological flow process to carry out continuous production. Therefore, it must be offered in whole sets to satisfy the demands of these processes. The broad ranks of engineers and technical personnel, especially comrades engaged in design and research work, must be familiar with and grasp the technological demands and flow processes of the user departments. In the past, we have had many weaknesses in this aspect. We cared only about facilities but not

the technology of use. We gave more consideration to single units of machinery, but gave less consideration to whole sets. For example, factories manufacturing crushers and ball grinders did not care much about other aspects of the mineral selection flow process and did not care about the coordination and the matching of facilities for ore selection that followed; therefore, they could not effectively improve the comprehensive technical level of whole sets of mining equipment. In these 2 years, some improvement have been made in this regard, but the situation must be completely turned around, and this requires a greater effort on our part.

(III) We Must Actively Develop New Products and Continue to Improve Old Products

The development of new products solves the problem of having or not having products. Improving old products solves the problem of the level of performance of products. Although present heavy mining machinery includes over 1,000 varieties of products in 401 series, there are still many types of equipment that are lacking. Therefore, new products must be actively developed. At the same time, old products that will always remain dominant in quantity must not be neglected. Old products cannot be retired except for those few in which changes and breakthroughs are made in principle and structure. After a certain period, old products actually become new products through continuous improvement from quantiative change to qualitative change. Take the hydraulic press as an example: Although it looks the same structurally and has always consisted of several large components--the main bar, the cross bar, the cylinder, and the plunger--and there have not been any major changes, nevertheless, continuous changes have been made in the method of transmission, in the efficiency of forging, and in precision control. The method of transmission has progressed from the sand box to steam pressurization and then to the high pressure pump with potential storage. In the last 2 years, the use of computer-controlled linkage between the hydraulic press and operating machinery has also been studied. Therefore, today's hydraulic press can be said to be an old product and it can also be said to be a new product, or more exactly, it is a new product proceeding from old varieties. The converter shows the same story. It was a new product in the middle of the last century, but later, the open hearth furnace emerged, so it had to step aside. At the middle of this century, the converter changed to the use of top blown oxygen and thus it was revived. This is the dialectic relationship between new and old products. Therefore, the experience of old products must be continually summarized. New technologies must be transplanted to them or grafted onto them so that they will remain young forever. At present, while improving old products, we should emphasize the improvement in quality, reduce the consumption of energy and raw materials in use, improve the use life of easily breakable parts and wear-resistant parts, and improve operating efficiency and reliability in operation. Old products can be kept in large quantities, and at a definite time they can be renovated. This favors improving economic benefits and technical improvements in all sectors. The future is broad.

(IV) We Must Emphasize Experimental Research

Scientific experiment is one source of correct human throught. Experimental research is the foundation of scientific and technical work. In the realm of our heavy mining machinery, the foundation in experimental research is very poor. During the Cultural Revolution, it was destroyed to a large extent. At present, we must regard it as a priority in scientific and technical work. Simply relying on theoretical estimation and mathematical calculations for a new product, a new improvement, or a new technology is frequently insufficient. They must also be proved by experimental research. Heavy mining machinery products are large. Some cannot be tested one by one or tested as a complete unit inside the factory. We should conduct simulated experiments, partial experiments, or experiment with parts and design the machinery units according to the results of experimental research. Some key technological processes in manufacturing also require experimentation. They can be applied in production only after the experiments have been successful. The whole machine must be subjected to load tests and technical performance tests before it leaves the factory. We should not take the factories and mines of the user departments as the labortories of manufacturing plants. Large foreign factories all have their own research and development centers. This is the root of their survival and the root of their ability to compete against similar factories. We must gradually establish and make sound the bases for experimental research and means of testing to create conditions for thoroughly changing the backward situation of heavy mining machinery.

(V) While the Enterprises Improve Products, They Must Carry Out Their Own Technical Improvement

In order to do a job well, the tools must first be sharpened. The major manufacturing plants of the heavy mining machinery industry are mostly over 20 years old. In the past, they have always been busy pursuing output, and with the destruction during the upheaval, the current technological means are outdated, and their own technical improvement cannot be delayed . Each enterprise should establish an improvement plan according to its own conditions and according to the urgency of the tasks. There are however, also some common aspects in the heavy mining machinery manufacturing industry that urgently need to be improved. For example, the hot processing system must be improved mainly to raise the internal quality of products and to conserve energy consumption; the entire welding operation line must be improved from preparing raw materials and removing rust to cutting, welding, removal of slag, and locating faults; and hard surface gear teeth must be popularized to improve the life of gears. In cutting work, advanced cutting tools have been used and digital display and numerical control devices are gradually being introduced. Of course, we should reduce power consumption as much as possible and appropriately rennovate factory buildings and equipment. The improvement projects in these aspects must be properly arranged one by one and implemented so that technical improvement of the industry itself can be carried out at the same time while carrying out technical improvements in other sectors.

(VI) We Must Correctly Handle the Relationship Between Organizing Efforts to Study Difficult Problems and Introducing Technology

In the course of scientific and technical exploration, it is common to organize efforts to study difficult problems or introduce technology from abroad to solve various difficulties. Our basic principle should be self-reliance. But to save time, we can introduce technology. During the last few years, we have tended to neglect introducing technology from abroad to hasten progress in solving major difficulties which otherwise require a relatively long time to organize our own efforts to solve. The technologies which we have introduced have not been conscientiously digested to establish a foundation for our own comprehension. There are a few projects which are carried out half-heartedly. While exploring the introduction of technology, full preparations should be made. To guard against the situation that arises when deals are unsuccessful, we must not relax preparations for organizing our own efforts to overcome difficulties. After introducing technology, we should convert our blueprints, standards and specifications to conform, and quickly utilize the technology, and in addition we should organize efforts to digest and understand the technology. This is a way to realize the goal of using introduced technology to improve our technical standards and to strengthen the capability of self-reliance.

(VII) We Must Strengthen the Technical Responsibility System and Disseminate It Into the Worksites

Without the responsibility system, plans cannot be implemented. In strengthening the technical responsibility system, we must advocate persistence from beginning to end and we must not change personnel midway. At least the main responsible people must not be changed. Only in this way can we train true technical experts. Now, there are too many managerial cadres in the technical departments while there are too few backbone technical personnel engaged in the projects. We must follow the spirit of simplicity and efficiency, eliminate some of the managerial duties of backbone technical personnel and let them serve as chief design engineers, heads of subject groups, and project chiefs and go to the front line of scientific and technical work. Engineering and technical personnel must conduct experimental research and serve production in the shops, and they should also go to the user departments to conduct installation and testing, work with the shifts, and visit the users on a regular basis. This is because they can truly examine whether the machines manufactured can realize the expected results only at the site of operation. In addition, they should go to the site of operation to serve the user departments on a regular basis, and they can thereby accumulate rich experience for us in improving products, developing new products, and researching new topics.

(VIII) We Must Continue to Learn and Improve Skills

Compared to the world's advanced nations, we are still relatively backward. To narrow the gap and catch up, we must continue to learn to improve our skills and talents. The broad range of engineers and technical personnel must learn in practice and they must pay attention to the following aspects of learning: First they must learn new technical knowledge. (Science and technology change constantly. If we do not study hard and learn, we will not

be able to improve our technical standards.) Second, they must acquire some knowledge of economics. (If engineers and technical personnel do not understand economics, scientific and technical knowledge cannot be used to serve the promotion of economic development well. For this, they must learn systems engineering, cost engineering, feasibility analysis, networking methods and managerial knowledge related to technical work.) They must also learn a foreign language well. (Foreign language is a tool. Engineers and technical personnel must at least be able to read foreign language technical information with the help of a dictionary.)

The above problems are important ones that must be solved so that scientific and technical work can become the priority. There are questions concerning ideology and working methods here. There are questions concerning work attitude and style, and it is possible that we have not covered them all and have not explained them thoroughly, and our views may not necessarily be right. It is hoped that the technical leadership at each level and the broad number of engineers and technical personnel in the heavy mining machinery manufacturing industry can join hands to consider, study and solve these problems together.

9296
CSO: 4008/218

APPLIED SCIENCES

CROMEMCO CHINESE CHARACTER SYSTEM DEVELOPED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 1

[Article: "Cromemco Microcomputer Configured into Chinese Character System"]

[Text] To enable several thousands of Cromemco microcomputers in our country to play a greater role in our national economy, the Mathematics Institute and Computing Center of the Chinese Academy of Sciences, and Wuxi Electronic Computer Plant conducted a joint study of the Cromemco systems, and came up with ways of adding on Chinese character (graphic) printing software, Chinese character (graphic) display control cards, and RAM boards without altering the hardware structure of the microcomputer systems, thus configuring them with means of inputting, editing, displaying, printing and processing Chinese characters and data. Though configured with Chinese language systems, the Cromemco machines still retain all of their original functions; the newly developed software systems provide a Western language/Chinese language switchover function, thus furnishing the Cromemco microcomputers with a relatively powerful means of processing information in either language.

This type of Chinese character system has been put to several months of practical use in scientific research, medical and military organizations with excellent results. It can be extensively used in other fields, such as business management, inventory control, information retrieval, information processing, file management, statistical reports, payroll computation, etc.

In October, the Wuxi Electronic Computer Plant will organize training classes aimed at completing the reequipping of Cromemco machines with Chinese character systems, popularizing the use of the systems, and helping users to develop a better understanding of Chinese character data base management systems and Chinese character BASIC.

9119
CSO: 4008/27

ZD-2000 CHINESE CHARACTER MICROCOMPUTER DEVELOPED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 1

[Article: "ZD-2000 Chinese Character Microcomputer Successfully Developed"]

[Text] Last September, the Computer Industry Administration of the Ministry of Electronic Industry organized a session to evaluate the ZD-2000 Chinese character microcomputer developed by the Yanshan Computing Center; the model was formally approved for batch production by North China Terminal Equipment Company.

The ZD-2000 Chinese language microcomputer is modular structured, using a microprocessor as the CPU. In accordance with the specific needs of users, various kinds of software modules and hardware modules can be selected and pieced together into different types of Chinese language microcomputers for various kinds of uses.

Following are three kinds of hardware configuration systems:

1. Basic System: Composed of microprocessor main control unit (32KB ROM, 16-32 KB RAM), Chinese character processing unit (4,096 Chinese characters internally stored), monochrome display unit, small size Chinese language printer, standard ASCII code keyboard, Vo24 communication interface, and cassette tape recorder

2. Full-Configuration System: Includes following additions: floppy diskette drives, color display unit, medium size Chinese language printer (24 pins) and large pen-driven Chinese character keyboard (3,500 characters).

3. Expanded System: According to various kinds of uses, appropriate cards or external bus expandor boxes can be added to the system; other optional expansion addenda include 32 KB RAM expansion card, A/D and D/A converters, IEEE 488 interface, Vo24 serial interface, language input recognition card and light pen.

It has two kinds of software configurations. One is BASIC work mode, i.e., a BASIC language software system which supports Chinese character processing and editing. Under this mode, the system becomes a standalone Chinese language microcomputer which can be used as a workstation for handling transactions in Chinese. The other mode is known as terminal work mode. Under

this mode, the system becomes a terminal of a computer mainframe. To enhance response and processing speeds, the system's software is written in assembler language, and various kinds of operations are carried out by means of special function keys. The system can thus be used as an online Chinese language terminal or standard terminal for large or medium frame machines, as well as minicomputers or microcomputers; it can perform screen editing functions on data or documents offline, as well as point-to-point communication in Chinese.

The successful development of the Chinese language microcomputer has created conditions for further developing Chinese language information processing systems, Chinese language communication systems, and Chinese language computer networks; it has opened a new realm for the extensive use of computers in our country. It can be used in a wide range of applications such as processing of official documents, file management, cadre/personnel management, enterprise and economic management, census register management, and statistics for state institutions, factories and mines, commercial and cultural organizations.

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HCP CHINESE CHARACTER INFORMATION PROCESSING TECHNOLOGY

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 2

[Article: "HCP Chinese Character Information Processing Technology Users Association Estsblished in Changsha"]

[Text] The Hunan Province Computing Technology Research Institute and Hunan Province Computing Center have successfully developed a Chinese character information processing system on Cromemco Z80-C microcomputers. They have also developed Chinese character printing technology for Dynabyte Z80-A,B microcomputers. These achievements are extensively used in some 20 provinces and cities throughout the whole country. In order to bring into play the social benefits of the system as soon as possible, and allow all users to exchange information and experiences, help each other tackle problems, and share resources, the "HCP Chinese Character Information Processing Technology Users Association" was recently established in Changsha City, Hunan Province.

All Cromemco Z80 or Dynabyte Z80-A,B microcomputer users who are interested in using the HCP Chinese character information processing technology can apply for membership. The members are expected to provide information on their application experiences and application situation; they can share all of the Association's achievements and resources at little or no charge at all.

9119
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PROBLEMS IN CHINA'S MICROCOMPUTER DEVELOPMENT DISCUSSED

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in chinese No 19, 5 Oct p 3

[Article by Professor Tao Shi [7118 2160], Computer Department of Guilin Electronics Industry College: "Five Problems Which Need to be Urgently Solved in China's Microcomputer Development"]

[Text] The growth of microcomputers in foreign countries is most astounding; every 3 years there is bound to be a minor change, and every 5 years a major change takes place. The 8-bit microcomputer which emerged in the mid-1970's has reached the stage of maturity; its hardware components are basically finalized in design, and its immense wealth of software is comparable with minicomputers. The 16-bit machine which appeared in the late 1970's has already gained a preliminary foothold in the market; its software is still in the midst of high speed development, but it is in the trend of replacing smaller machines. Several kinds of 32-bit microprocessors have emerged over the past few years; even newer CPU chips are continuing to emerge, and software development s still in the embryonic stage; but in view of the impending growth, it is predicted that 32-bit machines will eventually replace high-speed small frame machines. As to 64-bit microprocessors and systems, American and Japanese experts predict that by 1985, it will be possible to put the entire CPU of a medium frame machine into a single chip. At the estimated price of approximately $5,000, the system memory can hold as much as 1 megabyte and will have 100 megabytes of external storage with capabilities comparable to most medium frame machines. In light of the situation, our country must strive hard to catch up; it must work steadfastly for more results in production, research and development, and education. Following are five problems which the author suggests should be solved quickly:

1. Increase State Funding and Formulate Domestic Subsidization Policy

The state should concentrate capital investments in the research and development, as well as production of LSI circuits. The logic begind this lies in the fact that the average number of years for the economic and durable use of IC equipment is only 4 years. As large scale integration moves toward super large scale integration, and the width of wires continuously decreases from 5 micrometers to 3 micrometers and 1 micrometer, capital investment in production equipment correspondingly increases to three-fold and eight-fold, i.e., the ratio of investment in the three kinds of equipment becomes 1:3:8.

In Japan, most of the microelectronics industry (i.e., IC circuit industry) was developed between 1976 and 1979 with capital incentives totalling $500 million invested by the Japanese Government and private sectors. The West European Common Market powers spent $2.2 billion on developing microelectronic technology, e.g., the United Kingdom spent $800 million on purchasing production equipment, popularizing applications and education; France put in $500-$600 million. From 1976 to 1979, West Germany funded 1,564 million marks for promoting computer industrial manufacturing; production, research and development, and popularization of applications each accounted for one third of the above sum.

China is currently in the stage of economic restructuring, and it is not realistic for the state to invest enormous sums of capital funds in the computer enterprise. But perhaps it is possible to assign some of the factories, research institutes and educational organizations to computer work. According to latest statistics, the output value of computer industry in the United States accounts for 50 percent of the entire electronics industry; the output value of computer industry in the Soviet Union accounts for 30 percent of the entire electronics industry. Our country's computer industry is extremely feeble, and the output value is probably less than 10 percent. Is it possible to switch LSI research institutes and plants, as well as some electronic equipment plants into computer peripheral plants and equipment assembly plants, and have them all unified under the centralized supervision of the Computer Industry Administration so as to be able to study problems related to configuration and production of components, equipment and peripherals in a rational and unified way?

In view of the characteristic of LSI production, the manufacturing of a new chip often cost as much as several millions of yuan, and production cost will not come down until several years later when the annual output reaches over 10,000 chips. In the past, besides producing small quantities of 8-bit chips, China could only fit and package chips. As a result, production costs could not come down, and it was impossible to increase the percentage of quality products. Thus, while manufacturing large quantities of few types, our country should also provide appropriate amounts of financial aid to its LSI plants and research institutes. Otherwise, we can never compete with other countries or improve the quality of our products. This is also the experience of Japan and the United Kingdom in developing semiconductor industry.

2. Importation of LSI Modules and Microprocessors Should Be Centralized by the State

Over the past 3 years, some electronic industrial plants (and a small handful of universities and research institutes) have been importing micromodules, assembling them into single board processors and complete machines, and reaping enormous profits by selling them at prices five to ten times the original cost. This is detrimental to the domestic national industries, causing such enterprises and organizations to lose motive power for developing technology and rely more and more on imported modules.

I think we should formulate a computer growth policy calling for centralized importation of LSI modules and microcomputers by the state, and putting a stop to the importation of parts or machines which China can already produce up to standard. As to those products which can not be domestically produced for the time being, the state should import them under a centralized system and market them domestically at high tax rates; the tax revenue will be used by the state for subsidizing domestic LSI and microcomputer industries. Advanced technologies or complete projects which are imported with the approval of concerned departments should be allowed to come in at low or no import duties at all. This not only helps to protect the national industries, but also enables us to import indispensable advanced technologies and equipment.

3. Produce PDP-11/23 Grade Computers and Use Them as Standard Models for Promoting Extensive Use of Computers in Our Country

Two problems have to be solved in order to promote the extensive use of computers in our country: First, we should provide domestic users with tens of thousands of fairly powerful but comparatively low-priced 16-bit computers (8-bit machines do not meet memory or capability requirements of general users). Second, we should train a contingent of people who have expertise in computer hardware and software, as well as user service.

Then, what kind of computer should be chosen for massive production and popularization in this country? In CHINA COMPUTERWORLD No. 12, 1982 issue, Li Tieying [2621 6993 2503] and Ta Yuming [1044 3768 6900] proposed to import PDP-11/23 structure. I agree with them. LSI-11/23 is a single board machine; PDP-11/23 is a minicomputer microminiaturized system composed of LSI-11/23 plus other components. It has the same capabilities as PDP-11/34; its processing speed is equal to 90 percent of PDP-11/34; its operation time is 1.7 microseconds, standard memory 128 KB, and can be expanded to 256 KB. Among the various kinds of minicomputers, the PDP-11 series has the richest library of software. The CPU of LSI-11/23 is composed of three chips; each chip integrates some 10,000 transistors. Our country is fully capable of producing such chips. In fact, some of the research institutes in China have had many years of preparation and are currently engaged in this kind of work.

In China, due to the "import fad" over the past 2 years which has been detrimental to our national computer industry, the marketing of products produced by quite a few domestic computer plants and peripheral factories has come to a standstill. If the Computer Industry Administration vigorously promotes research and development of a prototype model scheduled to be completed by 1983, and begins to produce 10,000 machines in 1984 and 1985, it would then be possible to galvanize ten LSI circuit plants, peripheral plants and computer assembly plants into full-steam production, and research institutes and schools of higher education could also be actively engaged in the development of support software and popularization of the machine. The current import price of a PDP-11/23 machine is approximately 150,000 yuan (128 K memory, configured with hard disk printer and four video display terminals). If we plan to domestically produce machines configured at the price of approximately 150,000 yuan the gross value of 10,000 machines would be 1,500,000,000 yuan,

which is sufficient for moving the entire computer industry of our country onto a properous road, and laying foundations for future growth.

4. Establish Microcomputer Research Institute and Conduct In-Depth Research on PDP-11/23+, 16-bit Microprocessors and Systems

The Ministry of Machinery Industry has already established a Microcomputer Application Research Institute in Hefei Industrial University; remarkable results have been achieved over the past few years, which has greatly helped the popularization of microcomputers. The Ministry of Electronics Industry and Computer Industry Administration will also set up research institutes devoted to the development of microcomputers, and satisfy the needs of the growth of microcomputer technology in this country.

At present, the microcomputer research institutes should first of all conduct in-depth study of PDP-11/23+ and Micro/PDP-11 to serve as reference for improving PDP-11/23 type machines. Digital Equipment began marketing these two new products in 1982.

PDP-11/23+ employs the improved version of LSI-11/23A. Its main memory can reach 1 MB, uses 10.4 MB disk controller and supports 1 MB direct access memory space. The capabilities of this system are comparable to PDP-11/44. It is said that the memory of PDP-11/23+ can be further increased to 4 MB, and the storage wordlength can reach 22 bits, which makes it almost comparable to PDP-11/70.

Micro/PDP-11 uses the CPU of PDP-11/23+; highly integrated modules are installed in its 5.75 inches tall case. It has 256 KB memory, 22 bits addressing capacity, 10.8 MB Winchester disk, controllers and power supply. The system can support eight online users, and is mainly used for computer-aided designing in engineering, process control, automatic testing, and instrument control. This type of system can also be used in distributed processing systems, and DECnet and Ethernet networks, which have become quite popular in recent years and are of reference value to further developing distributed computers and computer networks in this country.

As to 16-bit microprocessors, the author believes that is is rather premature now to decide which model to choose.

In the author's opinion, the best approach is to spend a few years conducting preview studies of Z8000, 8086 and 68000 microprocessors and systems; model selection, full scale work and investments in production should wait until 1984.

The best thing to do now is to establish microcomputer research institutes in the same vicinity as computer assembly plants and computer colleges, thus allowing them to coordinate with one another, and jointly promote the growth of the computer enterprise. If funding is a problem, then perhaps it is possible to first establish computer colleges and temporarily set up research institutes on their campuses; the research institutes should be initially staffed with 50 employees, and gradually developed.

5. Establish Computer Colleges and Training Schools Primarily Aimed at Training Microcomputer Personnel

Sponsored by the Computer Industry Administration, Beijing University has established an affiliated school primarily for software engineering. This affiliated school should be expanded into a computer software engineering college. Besides, the author suggests setting up another computer college or converting one of the four colleges affiliated to the Ministry of Electronics Industry into a computer college which should have departments of precision machining and peripherals, computer communication network, computer science (mainly software), microcomputer engineering (software and hardware combined), microprocessor and microcomputer application, computer control, etc. The computer science disciplines and faculty members of the four colleges need some readjustments and centralization to enable our country's computer science and industry to move forward in large strides. In addition, it is also necessary to set up another computer training school for training programmers and computer peripheral and overall assembly technology personnel; or, perhaps we could set up polytechnic schools on college campuses which would be equivalent to 2-year colleges in the United States and Japan.

Some people think that the training of computer personnel in our country has reached the point of saturation, and that there will be no job vacancies for future graduates. The author believes that the "surplus personnel: theory is merely a superficial phenomenon related to the temporary standstill in the marketing of domestically produced computers. If tens of thousands of machines with PDP-11/23 capabilities are manufactured as suggested in this paper, there will be a shortage of personnel in plants and research institutes, and more people will be especially needed to popularize the machines. The computer enterprise in our country will have a spring of vigorous growth!

9119
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ENGLISH-CHINESE GENERAL-PURPOSE MICROCOMPUTER OPERATION SYSTEM

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 7

[Article by Xiao Ping [5618 1627] and Chen Mei [7115 5448], Jiangsu Province Computing Technology Institute: "English-Chinese General-Purpose Microcomputer Operation System--EC-DOS"]

[Text] With the development of microprocessor application, many users look forward to the development of microprocessors which can process Chinese character information. For the general user, a Chinese character processing system should have adequate software support, i.e., all kinds of high-level languages which can recognize and process Chinese characters. System software expenses would certainly increase sharply if we were to redesign high-level languages for this purpose. Thus the best approach is to fully exploit available system software resources while making them meet the preceding requirements. In order to do this, two aspects have to be taken into consideration: First, something has to be done to make the system software (e.g. assembler, high-level BASIC, FORTRAN and COBOL languages) of available systems recognize Chinese characters without altering the language compiler programs. The available utility programs should also be fully utilized and enhanced with Chinese-acter processing capability through only a minimal amount of modifications. Apart from this, new systems with expanded capabilities to process Chinese language information should retain all the functions of the original system, thus turning them into systems capable of processing both Chinese and Western languages.

Our research was conducted on a Dynabyte A machine. Its CP/M operating system was expanded with newly developed EC-DOS (English/Chinese universal disk operating system) capabilities which are compatible with CP/M. All of the original system software programs can run under the EC-DOS operating system, and have the additional capability of recognizing and processing Chinese characters. Thus, the compiler programs of all high-level languages can be used without need for making any kind of modifications, and the users do not have to worry about any additional rules or requirements.

Modification and Expansion of CP/M

As we are already familiar with the three layer structure of the CP/M operating system, i.e., CCP, BDOS and BIOS, it will not be discussed here.

Two things have to be done in order to add Chinese character processing capability to the operating system: First, its I/O must have the ability to recognize Chinese characters; second, it should be able to convert Chinese characters into standard ASCII character set exchange codes. This will allow the system to process Chinese characters in the same way as processing ASCII characters. To meet the first requirement, a new operating system, EC-DOS, is developed by making minimal changes to BDOS and expanding BIOS. The expanded portion is called CCH as shown in the accompanying figure; it includes input processing and output processing units. The input processing unit recognizes Chinese characters, and can convert Chinese characters into standard ASCII form exchange codes. The Chinese recognition characters are built into the unused portion of the ASCII character set. The output processing unit recognizes Chinese characters, selects dot matrices from the Chinese character word bank and sends them to the buffer zone, and drives the peripherals.

As Chinese recognition characters and input Chinese character codes are converted into ASCII characters, high-level languages can thus process Chinese character strings in the same way as ASCII character strings, thereby creating basic conditions for the use of high-level languages.

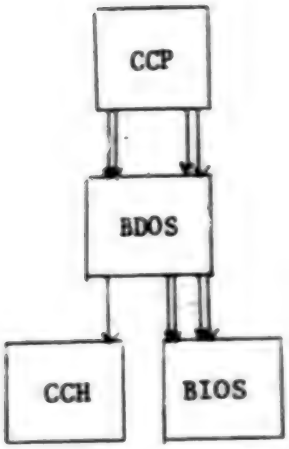
The expanded portion [of the operating system], is stored on floppy diskette as an auto-execute file; when the system is booted, CCH is automatically loaded into the memory and combined with the modified CP/M to form the EC-DOS operating system. As the Chinese character process function is the expanded portion of the operating system, there are no special requirements for Chinese character I/O equipment. All that is required is to make corresponding modifications and expansions in the CCH for different types of Chinese input equipment, coding methods and output equipment.

A Comparatively Practical System

We tried hooking the system onto a Chinese character wire printer produced by Suzhou Shengli Radio Plant; the original system's Western-language keyboard was used as the imput device (the Chinese character coding method developed by Zhi Bingyi [2388 4426 1744] of Shanghai Instruments Research Institute was used for inputting and coding Chinese characters), and the original CRT was used as the character display unit, thus forming an English/Chinese interchangeable microcomputer system. In the experiment, we used Cromemco's BASIC, FORTRAN and COBOL languages, and the desired results were achieved. A payroll program originally developed in BASIC was used in the experiment with slight modifications in character string lengths, and repalcements of original ASCII character strings with corresponding Chinese character strings. The program functioned properly.

As Cromemco System-3's CDOS operating system is compatible with CP/M, and their structures are similar as well, Cromemco System-3 can also process Chinese character information by making similar modifications and expansions in CDOS. It can be converted into a feasilbe English/Chinese interchangeable microcomputer system by adding Chinese character peripherals and a Chinese character word bank.

Figure: EC-DOS Structure



9119
CSO: 4008/27

NEW MICROCOMPUTER-CONTROLLED SIGNAL SYSTEM FOR HYDROPOWER PLANT

Beijing JISUANJI SHIJIA [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 1

[Article: "Gezhou Dam Hydropower Plant Employs New Microcomputer-Controlled Signalling System"]

[Text] The Gezhou Dam Hydropower Plant has many generating units with all kinds of primary and auxiliary equipment requiring a multitude of monitoring signals. The units, moreover, are dispersed over a fairly wide area, not to mention the important role Gezhou Dam Hydropower Plant plays in the Central China Power Grid, which calls for even stringent requirements in safety and monitoring measures. In late 1977, the Nanjing Automation Research Institute of the Ministry of Water Conservancy and Electric Power, the Planning Office for Changjiang [Yangtse] River Basin, and inland pilot power stations began to develop the SXJ-1 accidents sequence display/recording device which was put to trial use for one and half years by inland pilot hydropower stations. The device was recently evaluated and approved by the Ministry of Water Conservancy and Electric Power. The evaluation board agreed that the device was "properly designed, reliable, and stable." The device also has such features as "expandability and resistance to interferences." It is now in full operational mode in Gezhou Dam Hydropower Station.

The device can monitor more than 750 kinds of signals covering the entire plant's accidents, malfunctions, and operations on a single 19 inch color screen. Chinese characters in different colors are used on the display unit for distinguishing the nature of the events, and the system can monitor the entire sequence of accidents and malfunctions in the plant with microsecond-level precision. It can display the main power nodal lines of the plant, call back the historical sequence of all kinds of signals, and accomplish other kinds of man-machine interactive functions. It has played a fairly useful role in the drive to improve the level of safety operations.

The device is equipped with a SD 078A microcomputer (6800 CPU) which is newly developed by the Nanjing Automation Research Institute. It has excellent universality, and meets the needs of power stations, transformer stations, and other users. As the device can output Chinese characters, it is possible to vastly improve discriminability under emergency conditions by adopting a hierarchical dispersed signal gathering system. The device also saves signal cables and is easy to set up.

With the exception of ten-odd imported LSI chips, the overwhelming majority of components of the device are supplied domestically, and it can be manufactured in this country.

9119
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COMPUTER SCIENCE DEPARTMENT ESTABLISHED IN XIAMEM UNIVERSITY

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 2

[Article: "Computer Science Department Established in Xiamen University]

[Text] The Computer Science Department of Xiamen [Amoy] University was officially established this year. At present, two disciplinary courses are offered: software and cybernetics. There are 30 new students enrolled in each of the courses this year. Professor Li Wenging [2621 2429 3237] is director of the department.

There are plans to construct a computer building covering 1,800 square meters of land in 1983. Preparations for the project are well underway now. The building will be used mainly for accommodating a medium frame computer and a minicomputer.

At present, the Computer Science Department already has two DJS-130 machines, one HP-85 microcomputer, and four Audromeda-11/B microcomputers. It plans to add more computer equipment in the future.

The academic activities of the Computer Science Department of Xiamen University are guided by an open door policy, i.e., employ scientific and technical personnel from various outside sources, including domestic sources, foreigners and overseas Chinese; anyone who is interested is welcome to work for Xiamen University.

The Department also welcomes scholars from both in and out of the country to come to teach at the university. Computer specialists from neighboring Taiwan Province are also welcome to visit or lecture, and thus promote mutual understanding and academic exchanges.

9119
CSO: 4008/27

SIXTH ANNUAL MEETING OF COMPUTER SOCIETY

Beijing JISUANJI SHIJIA [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 1

[Article: "Sixth Annual Conference of Computer Society Convenes in November]

[Text] The Sixth Annual Conference of the China Computer Society of the Electronics Institute will be held in Zhengzhou from the 5th to 11th of this coming November. At the conference, an election of committee members will be held, and the participants will explore the relation between China's computer science and technology enterprise and the development of science. The meeting will study and probe into the overall situation underlying the question of how to develop computers in our country.

9119
CSO: 4008/27

COMPUTER AIDED SOFTWARE TRANSPLANT

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 7

[Article: "Computer Aided Software Transplant"]

[Text] To expend the application range of a computer system, under certain circumstances, we often have to transplant software from another computer system. The common practice is to analyze first before transplanting, i.e., first analyze the software of the other system before transplanting it to our own system. The task can be quite formidable when the software contains a large number of programs but lacks adequate documentation. Recently, the Shanghai Computing Institute sucessfully transplanted the ISIS-II operating system, 11 utility programs, and the compilers (interpreters) of 4 languages (macroassembler, BASIC, PL/I and FORTRAN) of an Intel MDS-230 microcomputer development system to a Chinese-made 056B/C microcomputer computer by means of a computer aided method instead of the conventional way.

The results of the new method are quite remarkable: It takes only 0.5 man years to transplant 600-700 KB of programs. It is reported that in the not too distant future, this project will be evaluated together with the 056 B/C microcomputer.

9119
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CONFERENCES ON COMPUTER APPLICATIONS, DISPLAY TERMINALS

Beijing JISUANJI SHIJIE [CHINA COMPUTERWORLD] in Chinese No 19, 5 Oct 82 p 15

[Article: "News Briefs on Meetings"]

[Text] From October 16 to 19, a marketing session will be held at A-1 Beihuan Xilu in Beijing. Customers can place orders for DT-110 character display terminals produced by Beijing Computer Peripheral Plant No 1.

From October 21 to 25, a DJS-100 series Computer Educational System Application Exhange Meeting will be held in Xi'an City's Xiaohan Hotel, and will include the following topics: general report on computer networks, application of computers in school administration, library catalog searching, etc. There will also be a demonstration at the meeting. The TP801 single-board computer will be put on exhibition as part of a marketing effort. The meeting is jointly sponsored by Shaanxi Bureau of Higher Education, Northwest Branch Association of the 100 Series Users Association, and Suzhou Electronic Computer Plant.

An academic symposium on display terminals will be held in Wuhan City in October. The Computer Society of the China Electronics Society will organize the meeting. Some forty papers will be presented at the symposium and will cover the following four major topics: (1) image and graphic display, (2) alphanumeric display, (3) special techniques, (4) Chinese character display and information.

The Computer Society of the China Electronics Society will sponsor an academic meeting from the 16th to 23rd of October 1982 in Lushan, Jiujiang City, Jiangxi Province for the exchanging of experiences on the maintenance and use of automatic plotters. A total of 63 academic papers will be presented at the meeting. The meeting will be jointly hosted by the Technical Division of Jiangxi Province's Electronics Industry Bureau and Jiangxi Province's Jiujiang Radio Plant No 2.

9119
CSO: 4008/27

SCIENTISTS AND SCIENTIFIC ORGANIZATIONS

HUANG WEILU, LAUNCH VEHICLE CHIEF DESIGNER PORTRAYED

Beijing GUANGMING RIBAO in Chinese 21 Oct 82 pp 2-4

[Newsletter by correspondents Sun Yinnan [1327 1714 0589], Ren Wanzhi [0117 5502 1807], and Ren Xianzhong [0117 3759 1813]: "Giving One's All for Spaceflight"]

[Excerpts] In the history of China's aerospace industry, many scientists, technicians, Party officials, as well as commanders of the Liberation Army, have contributed much of their labor, sweat, and blood to the success stories of many aspects of the industry. A typical representative of this group is comrade Huang Weilu, [7806 4885 4389], vice chairman of the scientific and technological committee of the Ministry of Aerospace Industry, deputy director of the Office of Chief Engineer, and chief designer of several rocket models.

Huang Weilu graduated from the original Zhong Yang University (now the Nanjing Engineering College), and later went to England for his graduate study. At that time, the second World War was in progress, and he witnessed many weak countries falling victims to the aggression of powerful imperialists. He became convinced that the survival of a nation or a people is closely related to the development of science and technology, and he was determined to make China regain its strength. With this determination, he returned to China in 1947.

In the mid 50's, when the aerospace industry in China was just being established, he participated in a major role of the research work in rocket control systems. Later, he directed the automated designs of the control systems on a number of China's rocket models, and made significant contributions to China's rocket development.

In the late 70's, Huang Weilu assumed the responsibility of chief designer of China's new rocket models and made further contributions to the aerospace industry.

During the past 20 years, Huang Weilu never questioned his work; he would go any place and take any job that was assigned by the organization. Regardless what the assignment was, he always worked diligently and completed his task with perfection. Step by step, he marched along the road of

science. He was considered the unnamed hero of science and a model representative of the scientific community.

(1) A scientific worker who loves his Party, his people, his country, and the socialist cause is, in general, totally dedicated to his career. Huang Weilu is such a devoted scientist. His sentiments toward the Party and the people are reflected in his totally selfless sense of responsibility in his work. It has been commented that rockets have become a part of his life.

In 1970, he was transferred to a job 60 li from his home. At that time, his three children were laboring on farms in the provinces of Heilongjiang and Yunnan; only his ailing wife and a 70-year old cousin were living with him. In spite of the long commuting distance, he never complained. In fact, since his unit's shuttle bus was not reliable, he often rode his bicycle to work. Once, he had an accident and broke his arm, but he did not say a word. Unable to ride the bicycle, he started riding the public bus to work. The bus route required three to four transfers between his home and his office, and it took him 3 to 4 hours each day, but he continued to keep his regular work schedule. Last October, returning from a business trip, Huang found his cousin home by herself; his wife was in a hospital waiting for major surgery. As he was again scheduled to participate in a technical conference, his superiors advised him not to attend. But he ignored it and departed immediately.

Due to prolonged hard work, Huang Weilu's health deteriorated. He suffered a variety of diseases: cataract, high blood pressure, ulcer, bone disease, and bronchitis; he was also running a low fever continuously. Nevertheless, he continued to devote all his energy to his work for the Party.

Once during the flight test of a launch vehicle, he was disturbed by the bad test results, and was listening to the opinions of his colleagues and at the same time performing calculations to determine the cause of failure. Noticing that Huang was covering his abdomen with his hand, his colleagues called the base doctor. The diagnosis was "thrombosis in the veins." The base commander wanted to send him to a hospital in Beijing immediately, but Huang said, "I cannot leave the scene before this problem is resolved." Finally, after repeated persuasion, he agreed to go back to Beijing for treatment. During his stay at the hospital, he learned of problems with the test of another rocket model. He immediately went to the test site and participated in the investigations and analyses until late at night when the problem was solved before returning to the hospital. In February of this year, Huang Weilu hosted a national conference. On the first night of the conference, he began to run a fever, and discovered blood in his stool. He figured it was caused by the chronic ulcer which resulted in bleeding from the stomach. Although he clearly realized the seriousness of the disease, he still insisted on completing his duty as chairman of the conference. Not until the end of the 5-day conference did he go to the hospital for checkup and treatment.

On another occasion, Huang traveled from Beijing to a launch vehicle test site to participate in a flight test. Because of the colder climate at the

test site, he came down with a severe cold, and suffered a high fever. But he still busily labored among the various work areas. On the evening of the final inspection, he was relieved of duty because of his physical condition, but he walked two li (Chinese miles) to the work site and stayed until the next morning.

(2) The following story has been circulating among the staff members of Huang's unit.

Once, during the "5-minute countdown" period before the launch of a rocket vehicle, the voltmeter in the feedback circuit of the 1st stage servo began to fluctuate. Upon hearing the report, Huang asked, "Is the platform all right?" The reply was "Yes." After pondering for a few seconds, he decided, "Launch as scheduled!" Everyone in the command center was sweating over his decision, but upon ignition the rocket roared skyward, and the flight test was a complete success. When the voltage fluctuations occurred before the launch, he judged it was caused by external factors which he had encountered during previous ground tests. Therefore, he was able to make the decision which resulted in cheers of victory.

In dealing with a problem, Huang always conducts careful research, and thoroughly investigates the practical aspects of the problem. He believes in a democratic approach to solving technical problems. Huang's colleagues consider him to be not only a knowledgeable and experienced commander who is capable of handling complicated technical problems, but also an open-minded leader who will listen to all different opinions.

(3) Aerospace projects are very expensive. A slight mistake may result in great financial losses to the Party and to the country, and may nullify the fruits of labor of thousands of people. As a technical director, Huang Weilu is fully aware of the responsibility on his shoulder.

During one of the rocket tests, the horizontal amplifier exhibited erratic behavior; the technicians were all discouraged because after an extended search no one could find the cause of the malfunction. When Huang arrived on the scene, he first tried to encourage his staff by asking them to concentrate on the "erratic" nature of the problem, then he joined in the testings and analyses. After personally disassembling the amplifier, he found a small iron chip on the relay unit, which cause the relay to behave erratically. Thus, the problem was solved.

During another assembly test of a rocket, the output signal of a transform amplifier exhibited irregular interferring "spikes." After a long search, it was found that the amplifier was affected by the operation of a crane in the workshop. However, Huang Weilu was skeptical about this conclusion, and suggested repeating the test under a different environment. The results showed that the interferring "spikes" were actually caused by one of the components of the amplifier itself. Thus, a potential problem was removed by replacing this component. The comrades at the test site were all very appreciative of Huang's effort in preventing a possible disaster.

Before every flight test, Huang always ensures that a team is organized to perform quality inspection, and to conduct exercises of imagined incidents in which potential problem areas and trouble spots are listed, and then the method of solution for each problem and preventive measures are presented. Thus, most potential difficulties are eliminated before the rocket is launched.

(4) Huang Weilu is specialist from the old society. After being educated by the Party, he was given the privilege in 1960 to join the Chinese Communist Party. Since that time, he has constantly placed demands on himself to meet the standard of a Party member. During the 3 years of natural disaster, considering the hardship faced by the Chinese people, he often refused the special benefits of living comforts given to him by the government. During the period of political struggle, he never made any comment which was against his conscience, and he never did anything contrary to the interest of the Party. Everyone considers him a friendly and easy-to-get-along chief, and enjoys working under his leadership.

Although he is quite well-to-do financially, he lives a rather austere life. Once he attended a meeting in the workshop dressed in his old cotton robes, he was mistaken for just another old technician. On the topic of automobile usage, Huang has the following rule: automobiles will not be used for private business, for transporting relatives, or for carrying family members. Huang's character and model behavior won praises from many scientific personnel, factory workers, Party officers, and military commanders.

In 1980, he was elected representative to the 7th Beijing citizen's convention, and was given the title of model worker. In 1981, he was named a "superior Communist Party member" and a "model soldier in the field of scientific research." In 1982, he was again named the "model worker of Beijing." In spite of all the praises and honors given to him, Huang still maintains his usual modest and conservative attitude. He always said, "The Party and the people have given me so much, and I have done so little for them."

3012
CSO: 4008/30

AUTHOR: JIAN Zequn [6456 3419 5028]
HE Hongqing [0149 3163 1987]

ORG: None

TITLE: "A Study of the Prediction of the Starting Transient Process of Solid Propellant Rocket Motors"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 31 Oct 82 pp 44-51

TEXT OF ENGLISH ABSTRACT: The interior ballistic P(x, t) model of the starting transient process of the solid propellant rocket motor has been improved in the present paper, with the aim of ensuring better accordance with the actual working conditions in the motor. The numerical solution of the governing equations, pertaining to one-dimensional unsteady gas dynamics, utilizes an implicit finite difference scheme combined with the method of characteristics. The computed pressure-time curve is in fair agreement with the experimentally measured one. It is evident from the results of computation that erosive burning is a main factor affecting the starting pressure-peak for a given propellant geometry, and the heat exchange between the combustion-gas and the solid propellant casts a great influence upon the processes of ignition-induction and flame-spreading.

[Continuation of YUHANG XUEBAO No 4, 31 Oct 82 pp 44-51]

Moreover, the rate of pressure change also plays an important role in the phases of flame-spreading and chamber-filling, and should hence be accounted for in the prediction. The computation program presented should provide a general means for the interior ballistic curve of accurate prediction of the starting transient process as well as for the investigation of the influences on it of the various factors involved.

AUTHOR: LIU Shenzhao [0491 1957 6856]

ORG: None

TITLE: "Sequentially Controlled Active Acquisition System of Gravity-gradient Stabilized Satellite"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 31 Oct 82 pp 52-64

TEXT OF ENGLISH ABSTRACT: This paper is concerned with the sequential control principle of an active acquisition system of gravity-gradient stabilized satellite with minimum hardware. In this system yaw sensors are not used and the velocity damping is realized effectively by using logical circuits to process infrared horizon sensor's information and, therefore, the expensive feedback packages are saved. Computation results show that this kind of control system is very powerful in adapting to launching the vehicle and gas jet actuator with eccentric thrust. It is possible to get much higher acquisition accuracy with a reasonable choice of system parameters. Unlike the traditional acquisition methods, a new acquisition concept is proposed in the paper.

9717
CSO: 4009/47

AUTHOR: BAI Feng [4101 6912]
WANG Yongping [3769 3057 1627]

ORG: None

TITLE: "The Importance of Light Diesel Trucks in Country Transportation"

SOURCE: Beijing QICHE GONGCHENG [AUTOMOTIVE ENGINEERING] in Chinese No 4, 1982 pp 1-6

TEXT OF ENGLISH ABSTRACT: In the PRC, almost 80 percent of the population is in the country. We have complicated terrain, with plains comprising only 12 percent of the total. Before liberation, manual labor was the main source of country transport. During the 1950's, heavy-duty bicycles, bicycles with trailers, hand-push carts and pneumatic-tire horse-drawn carriages were used extensively in country transportation. This was great progress. Beginning in 1979, both farming and industrial economy in the country advanced by leaps and bounds. The demand for trucks, especially those that were diesel powered, appeared because the amount of country highways reached 585,000 km, and experience had already been attained in using diesel engine powered tractors and irrigation pumps. At the end of 1981, the number of trucks in the rural areas had reached 175,000, including 40,000 diesel-powered vehicles.

AUTHOR: LIU Jiahe [0491 1367 7729]

ORG: Parts Design Office, Second Automotive Construction Works

TITLE: "Introduction to Engine Electronic Control (EEC) and a Preliminary Study of Its Usage in China"

SOURCE: Beijing QICHE GONGCHENG [AUTOMOTIVE ENGINEERING] in Chinese No 4, 1982 pp 22-27

TEXT OF ENGLISH ABSTRACT: This is an introduction of the status quo of EEC in the world. Then, a preliminary study of the feasibility of the adoption of this technique in China is given.

9717
CSO: 4009/52

AUTHOR: YANG Qizhong [2799 0366 0022]

ORG: Department of Mining Engineering, Chongqing University

TITLE: "Development of Wind Tunnel for Calibrating Mine Airmeter"

SOURCE: Chongqing CHONGQING DAXUE XUEBAO [JOURNAL OF CHONGQING UNIVERSITY] in Chinese No 3, 1982 pp 118-130

TEXT OF ENGLISH ABSTRACT: The development of a wind tunnel for calibrating a mine airmeter is one of the research subjects that needs an immediate solution for safety in coal mining. The measuring device described in this paper is based on Bernoulli's law and the fluid continuous law. Referring to domestic and foreign relevant materials, the device was successfully constructed after a three-year investigation. It consists of three parts: a) a tunnel system creating a uniform flow field; b) electrically controlled circuit with voltage regulation and stepless speed regulation; and c) air speed monitoring instrument system, including traditional dynamic pressure measuring system with pilot tube, and some new methods such as photoelectric and electronic frequency measurements.

This paper introduces only the design of the wind tunnel. The accuracy of measurement with this wind tunnel is up to 1.3 percent, while the accuracy required in the standards published by the Ministry of Coal Industry of China

[Continuation of CHONGQING DAXUE XUEBAO No 3, 1982 pp 118-130]

is 1.5 percent. With this wind tunnel, one can calibrate the mine airmeter for low, medium and high air speeds ranging from 0.2 to 30 m/s. In addition, this wind tunnel may be used for calibrating the pilot tube and conducting experiments with respect to hydromechanics.

AUTHOR: WEN Qingdong [5113 1987 2639]

ORG: Heat Power Engineering Department, Chongqing University

TITLE: "Research on an Automatic Solar Tracking Installation"

SOURCE: Chongqing CHONGQING DAXUE XUEBAO [JOURNAL OF CHONGQING UNIVERSITY] in Chinese No 3, 1982 pp 131-135

TEXT OF ENGLISH ABSTRACT: The automatic solar tracking installation recommended in this paper is composed of the DDZ-II type conventional process controller, a tracking sensor and an automatic initial position returning mechanism. Among the striking features of this installation are high output torque, fast response, reliability and low cost. With the use of the silicon controlled rectifier and speed reduction by planet gears, the installation is expected to have long service life and high transmission efficiency.

The installation also has many desirable functions, such as east-west direction automatic tracking, electric remote control tracking and automatic return, etc.

The installation can be used as a solar tracking system in large and medium scale solar power generation units. It can also be used as an experimentation stand in solar energy research laboratories.

9717
CSO: 4009/64

AUTHOR: None

ORG: None

TITLE: "Brief News of a Conference"

SOURCE: Guangzhou JICHUANG YU YEYA [MACHINE TOOL AND HYDRAULICS] in Chinese No 5, 15 Oct 82 pp 48-49

ABSTRACT: On the basis of suggestions of the 132 delegates attending the National Hydraulic Servo-Control Mechanism Teaching and Learning Conference of Aug 81 in Kunming, the Yunnan Provincial Science Association and the Kunming College of Engineering, under the direct leadership of the party committee, spent a year to prepare for the Conference for the Establishment of the National Fluid Control Engineering Research Society and Its First Annual Conference, which was officially held in Jiujiang City of Jiangxi Province on 19-27 Jul 82. Participants included 258 delegates representing 187 organizations of all provinces and cities of the country. A total of 58 papers were received and all were delivered before the conference or a group of delegates. The papers touched upon basic theories, research and application of components, analysis of dynamic characteristic of systems, test and measurement, numerical simulation, computer control, and optimization designing. During the conference, the 2 reference textbooks of Basic Control Theory and Designing and Analysis of Hydraulic Servo Systems were discussed and some valuable opinions proposed. Finally, the constitution of the society and an outline of it were passed and members of the society's board of directors elected. The work of preparing the next annual conference was also properly arranged.

6168
CSO: 4009/54

AUTHOR: LIU Zutang [0491 4371 0781]

ORG: None

TITLE: "Successful Fabrication of HWL-1 Constant Temperature Heater Current Meter for Turbulent Research"

SOURCE: Beijing LIXUE YU SHIJIAN [MECHANICS AND PRACTICE] in Chinese Vol 4 No 4, Nov 82 p 77

ABSTRACT: East China College of Water Conservancy and Nanjing Electron Tube Plant have successfully made the HWL-1 constant temperature hot-wire current meter through joint research. Its major functions are to measure the average current velocity of one-dimensional and two-dimensional gaseous space point, momentary current speed, pulse current speed, speed distribution of boundary layer, degree of turbulence, Reynolds stress, etc. It may also be used for simple frequency spectrum analysis. The prototype has been tried by Nanjing College of Aviation, University of National Defense Science and Technology, the 708 Institute of Ministry of Machines No 6, Research Institute of Water Conservancy and Hydroelectricity Ministry of Hydroelectricity, etc. where the test results were compared with those of the System 7224 made in Japan, DISA made in Denmark, and the TSI made in the USA and found to be basically identical. Its major technical indices were found to correspond with the Japanese System 7224. Following its most recent certification by Jiangsu Provincial Bureau of Higher Education, Nanjing Electron Tube Plant has been assigned to produce it.

AUTHOR: None

ORG: None

TITLE: "High Speed Photography of the Penetration Process"

SOURCE: Beijing LIXUE YU SHIJIAN [MECHANICS AND PRACTICE] in Chinese Vol 4 No 4, Nov 82 p 77

ABSTRACT: During its penetration mechanism research, the Office No 2 of Research Institute of Mechanics Chinese Academy of Sciences used the ZFD-50 holding type rotary lens style high speed camera to photograph the high speed collision penetration process. Clear and continuous pictures (illustrated in the paper) of the penetration process were obtained. The ZDF-50 holding type high speed camera is capable of shooting 500,000 frames per sec. The light exposure time for each frame is 0.82 μsec. The ZFD-50 high speed camera is the product of Xian Institute of Optical Machines.

6248
CSO: 4009/53

AUTHOR: ZHANG Zhixun [1728 1807 6113]

ORG: Iron and Steel Division, Ministry of Metallurgical Industry

TITLE: "Present Condition and Future Prospects of Sintering and Pellet-production Technology in China"

SOURCE: Beijing GANGTIE [IRON AND STEEL] in Chinese No 10, Oct 82 pp 61-67

ABSTRACT: In these 30+ years, there have been 2 periods of great strides in the development of sintering technology in China: (1) late 50's to early 60's: Technique of adding lime for steam preheating was successfully adopted at Anshan Steel Mill, etc. in 1959; Chungqing Steel Mill began to use ultrabasic sinter in 1963 to produce a more economic technique of blast furnace smelting of high oxide silicon ores that are difficult to dress. (2) After 1976: The production of sintered ores increased 64 percent; the consumption of solid fuel was reduced 25 percent. Compared with foreign countries, some work processes are incomplete, equipment is backward, the level of work techniques is low, and the quality of sintered products not as high. Moreover, the energy consumption is still too high and environmental protection too poor. A long list of reform measures is proposed. Pelletizing experiments, started in foreign countries in the middle 40's, began in Anshan Steel Mill in 1958. After 1968, 10+ small operations were set up. By late 1981, pellet-producing capability in China amounted to about 8 percent of the total artificial aggregate-producing capability of the country. These operations are described in some detail.

AUTHOR: None

ORG: None

TITLE: "Symposium on Metallurgical Reaction Kinetics and the 2nd Symposium on Steelmaking Theory"

SOURCE: Beijing GANGTIE [IRON AND STEEL] in Chinese No 10, Oct 82 p 78

ABSTRACT: The Metallurgical Reaction Kinetics Symposium and the 2nd Symposium on Steelmaking Theory, jointly sponsored by Metallurgical Process Physics-Chemistry Committee ChinSteelmaking Committee of China Society of Metals, was held in Chungqing, on 12-16 Apr 82. Participants included 124 official delegates of 60 units. More than 100 persons also attended as invited guests. The symposiums received 42 papers, the contents of which included kinetics of various kinds of reactions, mathematical and physical simulation, application of transmission in metallurgy, experimental methods, and comprehensive discussions. There were 6 delegates recently returning from studies abroad. They all delivered papers and introduced foreign metallurgical research studies. Recently, metallurgical kinetics research is very active internationally. It was suggested during the meetings that the Metallurgical Process Physics-Chemistry Committee Chinese Society of Metals should establish a Metallurgical Kinetics Group.

AUTHOR: SONG Xuexiao [1345 1331 1321]

ORG: None

TITLE: "Scientific Conference on Special Metallurgy and Electrometallurgy"

SOURCE: Beijing GANGTIE [IRON AND STEEL] in Chinese No 11, Nov 82 p 81

ABSTRACT: The 1982 Scientific Conference on Special Metallurgy and Electrometallurgy of China Society of Metals was held in Shenyang, on 25-29 Apr; more than 120 members of the group, authors of papers, and invited guests attended. The papers basically reflected the economic benefits from the reform measures adopted in China in recent years. The power consumption per ton of steel has been reduced from the 2,000 kwh of the past to 1000-1500 kwh, as low as 800 kwh in some cases. Due to the use of computer control, the smelting process is stabilized to cause the quality of the steel to be improved. Due to the development of trace elements volatilization, vacuum deoxidization and denitrification, the product quality of vacuum metallurgy has been improved. The delegates believed that the economic property of the electroslag equipment is poor and manufacturing department should prepare for replacement. Research on work procedure should still emphasize quality, with economic benefits as an added goal only. Studies on the application of basic theories should be strengthened to improve cooperation between research institutes and factories so that theoretical research may serve production still better.

AUTHOR: None

ORG: None

TITLE: "1983 Plan of Ironmaking Society Activities"

SOURCE: Beijing GANGTIE [IRON AND STEEL] in Chinese No 11, Nov 82 p 82

ABSTRACT: The Ironmaking Committee of China Society of Metals has plans of calling the following conferences in 1983: (1) A symposium on the reconstruction of current blast furnaces and sintering machines. It will be sponsored jointly by Ironmaking Committee and Metallurgical Equipment Committee, last 6 days, and attended by about 120 delegates.(2) Symposium on inspection technology and automation to discuss mainly domestic and foreign blast furnace inspection and testing techniques, and computer automatic control to investigate the possibility of using new testing instruments and computers for blast furnaces in China. It will be jointly sponsored by Ironmaking Committee and Automation Technology Committee, to last 5 days, and to be attended by about 120 delegates. (3) Symposium on Iron Smelting Physics and Chemistry to discuss mainly problems of iron making and aggregate producing theory. It will last 5 days and be attended by about 50 persons.

6248
CSO: 4009/50

AUTHOR: LI Feng [7812 7364]

ORG: None

TITLE: "First National Symposium on Color Center Laser Held in Quanzhou"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 2 No 6, Nov 82 p 516

ABSTRACT: The First National Symposium on Color Center Laser was held 5-10 Jun 82 in Quanzhou City, Fujian Province, under the auspices of Optical Materials Specialty Committee of China Society of Optics and the Department of Chemical Engineering of Quanzhou Overseas-Chinese University. Participants included 68 delegates representing 33 organizations all over the country. The contents of the 37 papers delivered included 8 specially requested papers on the formation of color center, its transformer and decay mechanism, the use of color center to produce laser and its experiments and theoretical investigations, and various possible aspects of applications of color center laser. In China, the work on solid state tunable color center laser has just begun. Judging from the reports presented this time, the work being conducted at the various organizations is more or less the same, concentrating on the F_2^+ center of alkaline-earth metal fluoride LiF crystals. It was proposed that Research Institute of Structure of Matters Chinese Academy of Sciences, Changchun Research Institute of Optical Precision Machinery, Shanghai Jiaotong University, Overseas-Chinese University, Tianjin University, Jilin University, and China Academy of Metrology should organize a cooperative team to study KCl color center laser and its application in metrological standards. It was also resolved that another symposium should be called in 2 years.

AUTHOR: ZHANG Shanshan [1728 3790 3790]

ORG: None

TITLE: "Technical Exchange Symposium on Optical Aspherical Surface Processing Held in Jiading, Shanghai"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICA SINICA] in Chinese Vol 2 No 6, Nov 82 p 530

ABSTRACT: A Technical Exchange Symposium on Optical Aspherical Surface Processing was held on 5-9 Jul 82 in Jiading, Shanghai. It was called by the Joint Committee of Optical Technology, which was organized by 6 research institutes of Chinese Academy of Sciences. The symposium was attended by 64 delegates, representing 17 organizations. Among the 29 papers received, delivery was arranged for 17, covering the following 3 general aspects: astronomical lens and aspherical surface processing technology here and abroad, new techniques of examining aspherical surface, and high precision aspherical surface cutting machines. To a certain degree, the symposium reflected the current level of technology of this field. The progress made by the participating organizations in processing as well as inspecting aspherical optical suface was apparent. It remains highly urgent to summarize the research studies on these subjects to meet the needs of scientific and technological development, however.

AUTHOR: YI Min [0044 3046]

ORG: None

TITLE: "First National Symposium on Basic Optics and A Meeting of the Basic Optics Specialty Committee Held in Beidaihe"

SOURCE: Shanghai GUANGXUE XUEBAO [ACTA OPTICS SINICA] in Chinese Vol 2 No 6, Nov 82 pp 546, 550

ABSTRACT: The First National Symposium on Basic Optics, sponsored by China Society of Optics was held on 24-28 Jun 82 in Beidaihe of Hebei Province. Participants included 131 delegates representing 54 organizations of 18 provinces and cities. The delegates were divided into groups to listen to the 76 papers, selected from more than 180 received. These papers may be classified in 6 categories: classic optics, laser spectroscopy, laser physics, intense light and nonlinear optical effect, optical information processing and holography, and atmosphere and waveguide optics. Enthusiastic discussions proceeded on the 4 special subjects of optical information processing, laser spectroscopy and laser physics, intense light and nonlinear optics, and classic optics. For many years, basic research is the weaker aspect of the field of optics in China. Judging from the papers delivered this time, although a great distance remains between the current level of this field in China and the advanced level of the world, very great progresses have been made. A very good beginning has obviously been established.

6168
CSO: 4009/58

AUTHOR: LI Zi [2621 6926]

ORG: Shanghai Research Institute of Power Generating Equipment

TITLE: "Conference on the Quality of Power Generating, Power Transmission and Transformer Equipment Held in Beijing"

SOURCE: Shanghai DONGLI GONGCHENG [POWER ENGINEERING] in Chinese No 6, 15 Dec 82 p 19

ABSTRACT: The Conference on the Quality of Power Generating, Power Transmission and Transformer Equipment, jointly called by Ministry of Machine Industry and Ministry of Water Conservancy and Electric Power, was held in Beijing on 30 Jul 82. More than 300 delegates, representing 67 subordinate units of Ministry of Machine Industry and the 56 subordinate units of Ministry of Water Conservancy and Electric Power participated. Using the serious accidents of thermal and hydroelectric power plants in recent years as typical examples, the purpose of this conference is to analyze the causes, absorb the lessons, improve the understanding, and formulate regulations to perfect the quality of products so as to raise the quality of power generating and transmission and transformer equipment. The conference proceeded in 4 segments. Items for perfecting thermal power equipment were nearly half completed. All efforts are being exerted to bring some effective results in 3-5 years.

AUTHOR: YANG Wengu [2799 2429 7711]

ORG: Shanghai Research Institute of Power Generating Equipment

TITLE: "Conference on the Strength of Pressure-bearing Vessel of Boilers Held in Beijing"

SOURCE: Shanghai DONGLI GONGCHENG [POWER ENGINEERING] in Chinese No 6, 15 Dec 82 p 74

ABSTRACT: A Conference on the Strength of Pressure-bearing Vessel of Boilers, sponsored by the Society of Motive Power Engineering, was held in Beijing on 7-11 Oct. Participants included 55 delegates of 30 organizations, such as Ministry of Labor Affairs, Qinghua University, Designing Academy No 2 of Ministry of Nuclear Industry, Shanghai Research Institute of Power Generating Equipment of Ministry of Machine Industry, etc. The conference was chaired by HONG Bangjun [3163 6721 0193] Director of Beijing Boiler Plant and a member of the board of the Society of Motive Power Engineering. The conference received 28 papers. Discussions proceeded in 2 groups of power station boilers and industrial boilers. Thermal stress field electrical simulation experiment, computation of temperature differential stress, and determination of temperature field, etc. were among the problems enthusiastically discussed.

6168
CSO: 4009/66

AUTHOR: CAI Hanwen [5591 3352 2429]

ORG: None

TITLE: "A Method for Calculating the Kill Probability of Antiaircraft Weapon With Touch Initiation"

SOURCE: Beijing BINGGONG XUEBAO [ACTA ARMAMENTARII] in Chinese No 4, Nov 82 pp 1-8

ABSTRACT: Antiaircraft weapons with touch initiation use, mostly, small caliber bullets and can destroy the target only if there is a direct hit. The kill action is obviously different from those antiaircraft weapons using large caliber, non-contact explosion type bullets. The existing kill probability calculation methods [2 papers of USSR origin are given as reference for these available methods] are; therefore, not applicable. This paper introduces an engineering calculation method, with which the position of the explosion point is determined on the basis of the external shape of the target and the manner of the encounter. The kill indices are established by the kill effect in the vicinity of the explosion point. Processes and equations needed for carrying out this type of calculation are provided.
This paper was received for publication on 22 Oct 80.

AUTHOR: WANG Shufen [3769 3219 5358]

ORG: None

TITLE: "A Two-Wave-Band Antireflection Coating"

SOURCE: Beijing BINGGONG XUEBAO [ACTA ARMAMENTARII] in Chinese No 4, Nov 82 pp 9-15

ABSTRACT: Presently, a transparency-enhancing thin-film is being commonly used to form an antireflection coating for optical instruments to raise their light penetrating property. With the development of science and technology, the number of composite optical instrument is rising and hence there is a growing need for an antireflection coating capable of enhancing the penetration of two or more wave bands. For example, in order to reduce the weight, the size of the YAG laser device has been made smaller to cause the visible spectrum aiming system and the 1.06μ wavelength laser emission and reception system to be combined so that an antireflection coating effective for both visible light and 1.06μ laser becomes an urgent need. This paper reports a procedure of using effective boundary theory analysis and designing to select the initial thin-film system before using the film for automatic designing program adjustment to produce, very conveniently, the optimal film system for the coating.
This paper was received for publication on 23 Feb 81.

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CSO: 4009/46

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